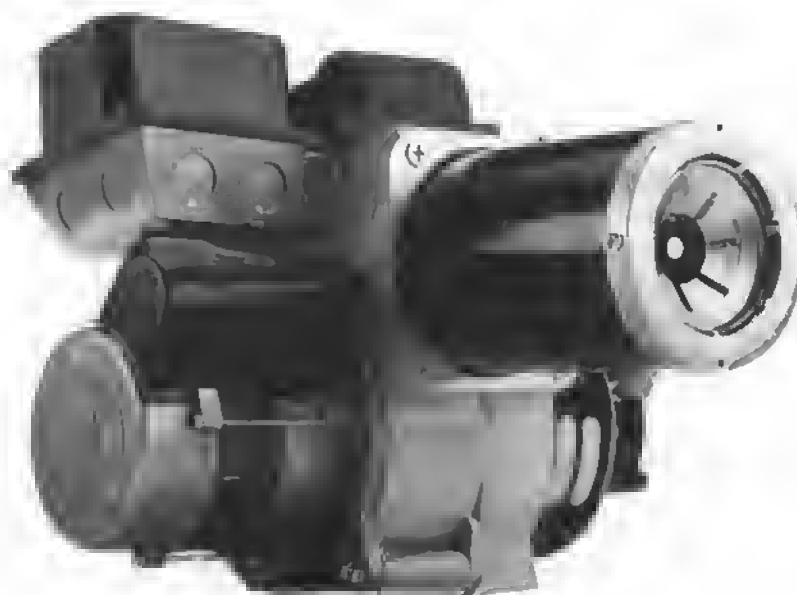




Model **AFG** burners for
GOLD OIL Series
High-Efficiency Oil-fired Boilers

Instruction Manual



DANGER

This equipment must be installed, adjusted and started only by a **qualified service agency** – an individual or agency, licensed and experienced with all codes and ordinances, who is responsible for the installation and adjustment of the equipment. The installation must comply with all local codes and ordinances and with the latest revision of the National Fire Protection Standard for Oil-Burning Equipment, NFPA 31 (or CSA B139-M91).

WARNING

Never attempt to use gasoline as a fuel for this burner. It is more combustible than fuel oil and could result in a serious explosion, causing severe personal injury, death or substantial property damage.

WARNING

Read all instructions before proceeding. Follow all instructions completely. Failure to follow these instructions could result in equipment malfunction, causing severe personal injury, death or substantial property damage.

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Prepare before installing

Verify ratings

Fuels	U. S. No. 1 or No. 2 heating oil only (ASTM D396) Canada No. 1 stove oil or No. 2 furnace oil only
Electrical	Power supply 120 VAC/60 HZ/single phase Operating load 5.8 AMPS maximum Motor 1/2 HP, 3450 RPM, NEMA 48M frame rotation CCW when facing shaft end Ignition Continuous-duty-rated solid state igniter
Fuel unit	Pump pressure See Table 1, page 4
Air tube	ATC code See Table 1, page 4
Dimensions	Height (maximum) 11 1/2 inches Width (maximum) 12 7/8 inches Depth (chassis only) 6 7/8 inches Air tube diameter 4 inches

Check certifications/approvals

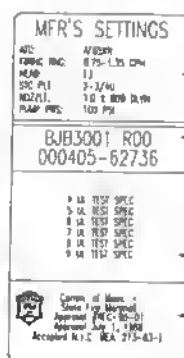
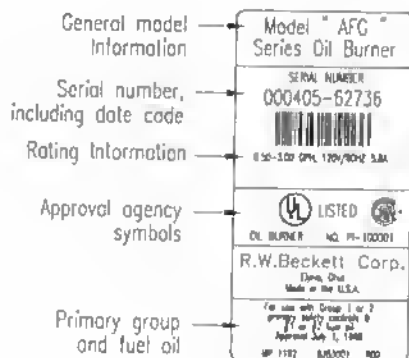
- Underwriters Laboratories has certified this burner to comply with ANSI/UL 296 and has listed it for use with #1 or #2 fuel oil as specified in ASTM D396.
- Low sulfur #1 and #2 fuel oils reduce heat exchanger deposits with all burners compared to the standard fuels. Reduced deposits extend the service interval for cleaning and improve the efficiency of the appliance over time. Low sulfur fuels reduce particulate and oxides of nitrogen emissions as well. The Oilheat Manufacturers' Association recommends these fuels as the preferred fuels for this burner.
- State and local approvals are shown on burner rating label (see below).
- All oil burners should be installed in accordance with regulations of the latest revision of the National Fire Protection Association Standard NFPA 31 and in complete accordance with all local codes and authorities having jurisdiction. Regulation of these authorities take precedence over the general instructions provided in this installation manual.
- For recommended installation practice in Canada, reference to CSA Standard B139-M91.

Notice special requirements

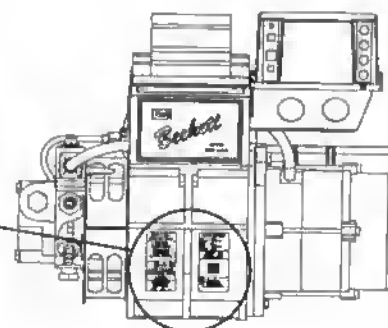
- NOTICE** Concealed damage — If you discover damage to the burner or controls during unpacking, notify the carrier at once and file the appropriate claim.
- NOTICE** When contacting Beckett for service information — Please record the burner serial number (and have available when calling or writing). You will find the serial number on the Underwriters Laboratories label, located on the left rear of the burner, or the cover mounting plate. See illustration below.

Be aware of hazard definitions

- DANGER** Denotes presence of a hazard which, if ignored, will result in severe personal injury, death or substantial property damage.
- WARNING** Denotes presence of a hazard which, if ignored, could result in severe personal injury, death or substantial property damage.
- CAUTION** Denotes presence of a hazard which, if ignored, could result in minor personal injury or property damage.
- NOTICE** Intended to bring special attention to information, but not related to personal injury or property damage.



- R.W. Beckett manufacturer's settings
- R.W. Beckett specification number and revision
- Can be customized by individual specification
- State and local approvals



Prepare before installing

Table 1 — Verify that burner specification number (on burner carton) and configuration agrees with information below

NOTICE The table below provides burner specifications and starting air band and air shutter settings for AFG burners applied to Weil-McLain Model GO oil boilers. Follow all instructions in this burner manual, the boiler manual and the fuel unit literature to install, setup and service the burner.

Boiler model	Burner spec. no.	Nozzle GPH / type					Pump pressure (PSIG)	Burner head type	Static plate	Drawer setting	Air tube combination (ATC)	Blower size (inches)	Starting air shutter position	Starting air band position
		Delavan	Hago	Monarch	Steinen	Danfoss								
GO-2	WL-4502C	0.75 70° B	0.75 70° ES	0.75 70° AR	0.75 70° S	N/A	100	L1	3¾" U	1½	AFG50MBAS	4¼	6	0
GO-3	WL4503C	0.85 45° B	0.85 45° B	N/A	N/A	0.85 45° AS	140	L1	3¾" U	1½	AFG50MBAS	4¼	10	0
GO-4	WL-4504C	1.25 80° B	1.25 80° B	N/A	N/A	1.25 80° AS	100	F-4	2¾"	1½	AF44WHPW	4¼	10	0
GO-5	WL-4505C	1.50 80° B	1.50 80° B	N/A	N/A	1.50 80° AS	100	F-6	3¾" U	1½	AF44YYPW	4¼	10	2.5
GO-6	WL-4506C	1.75 80° B	1.75 80° SS	1.75 80° R	1.75 80° S	N/A	100	F-12	2¾"	1½	AF44XOPW	4¼	10	3
GO-7	WL-4507C	2.00 70° B	2.00 60° B	N/A	N/A	2.00 70° AS	100	V1	2¾" M	4	AFG50MK	4¼	10	4
GO-8	WL-4508C	2.25 60° B	2.25 45° P	2.25 60° PLP	N/A	N/A	100	V1	2¾" M	5	AFG50MK	4¼	10	5
GO-9	WL-4509C	2.50 60° B	2.50 60° P	N/A	N/A	2.50 45° AS	100	V1	2¾" M	5	AFG50MK	4¼	10	8

Inspect/prepare installation site

Chimney or vent

- Inspect the chimney or vent, making sure it is properly sized and in good condition for use. Refer to the boiler manual for details.

WARNING Do not leave the boiler/burner operating if the vent system is not in good condition or if the vent system does not provide the required draft in the boiler combustion chamber given below under "Draft regulator." Failure to provide a correctly sized and operational vent system could result in severe personal injury, death or substantial property damage.

Draft regulator

A draft regulator (barometric damper) is furnished with the boiler and should be mounted in the smoke pipe between the boiler and the chimney, approximately 18 to 20 inches from the boiler smoke pipe collar. Adjust the draft regulator using a draft gauge inserted in a test opening between the boiler and the regulator. Set the draft regulator to obtain a boiler combustion chamber draft of approximately -0.01 to -0.02 inches w.c. during steady operation.

Combustion air supply

See NFPA Standard 31 and the boiler manual for complete details.

WARNING If the burner is not supplied with a reliable combustion air source, the burner cannot properly burn the fuel. This would result in incomplete combustion, causing sooting and possible emission of carbon monoxide. Severe personal injury, death or substantial property damage could occur.

Outside air kit applications

Refer to separate instruction sheet supplied with AFG outside air kit for installation. This optional kit allows combustion air to be piped directly to the burner. (Part number 51747.)

WARNING You must install the outside air kit strictly following the kit installation instructions. Do not attempt to install outside air piping without using the AFG outside air kit and instructions. Failure to do so could result in burner or heating appliance failure, causing potential severe personal injury, death or substantial property damage.

Clearances to burner and appliance

- Provide space around burner and appliance for easy service and maintenance.
- Check minimum clearances against those shown in the boiler manual and required by applicable building codes.

Prepare burner

To remove or service nozzle line assembly, when required:

- Turn off power to burner before proceeding.
- Disconnect oil connector tube from nozzle line.
- Loosen the two screws securing igniter retaining clips and rotate both clips to release igniter baseplate. Then tilt igniter back on its hinge.
- Remove splined nut.
- "F" head air tubes
Remove nozzle line assembly from burner, being careful not to damage the electrodes or insulators while handling. To ease removal of long assemblies (over 9 inches), rotate assembly 180° from installed position after pulling partially out of tube.
- "L1" and "V1" head air tubes
Slide nozzle line assembly forward (further into air tube) so the head clears the venturi opening. Then rotate the nozzle line assembly 90° so the nozzle line end points up. Pull the nozzle line assembly toward you and remove assembly from burner.
- To replace the nozzle assembly, reverse the above steps.

Prepare burner (continued)

Check/install burner nozzle

WARNING Make certain the nozzle is selected for the fuel unit pressure used. For applications with fuel unit pressure above 100 psig, the nozzle rated capacity will be less than the appliance firing rate. **Use only the specified spray pattern and type listed in Table 1, page 4.** Failure to use the correct nozzle size and type can result in unacceptable combustion, possibly causing severe personal injury, death or substantial property damage.

- Place a $\frac{3}{4}$ " open-end wrench on the nozzle adapter. Insert the nozzle into the adapter and finger tighten. Finish tightening with a $\frac{1}{2}$ " open-end wrench. Use care to avoid bending the burner head support legs or electrodes. See **CAUTION**, below.
- If you remove the head to replace the nozzle (type "L1" or "V1" heads), carefully reconnect the head to the nozzle adapter, making sure to butt the head support to the nozzle adapter shoulder (see Figures 3 and 4, page 7).

If the nozzle is already installed, remove the nozzle line assembly to verify that the nozzle size and spray pattern are correct for the application. See Table 1, page 4 for nozzle specifications. Verify that the electrode tip settings comply with Figure 1, below.

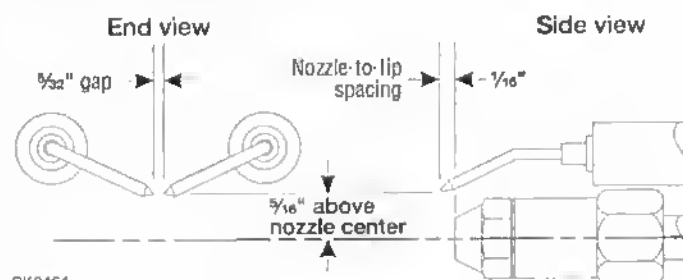
CAUTION Use care when removing and installing oil nozzles:

- Inspect the nozzle adapter before installing nozzle. If it is grooved or scratched on the sealing surface, replace the nozzle line assembly. Otherwise, oil could leak at the nozzle-adapter joint, causing serious combustion problems.
- Protect the nozzle orifice and strainer when installing. If the orifice gets dirt in it or is scratched, the nozzle will not function properly.
- Do not over-torque the nozzle when installing. This will cause deep grooves in the nozzle adapter, preventing a seal when a new nozzle is installed.
- Use a wrench or vise to hold the nozzle adapter. **DO NOT** attempt to remove or replace nozzle without holding adapter. The nozzle alignment could be seriously damaged. Use a nozzle wrench that secures the adapter or use $\frac{3}{4}$ " and $\frac{5}{8}$ " open-end wrenches.
- Do not squeeze the electrodes too tightly when handling the nozzle line assembly. This could change the electrode tip settings or damage the ceramic electrode insulators.
- Carefully check and realign electrode tips after replacing nozzle, ensuring the electrode settings comply with Figure 1.

Check/adjust electrodes

Check the electrode tip settings. Adjust if necessary to comply with the dimensions shown in Figure 1. To adjust, loosen the electrode clamp screw and slide/rotate electrodes as necessary. Securely tighten the clamp screw when finished.

Figure 1 — Electrode settings

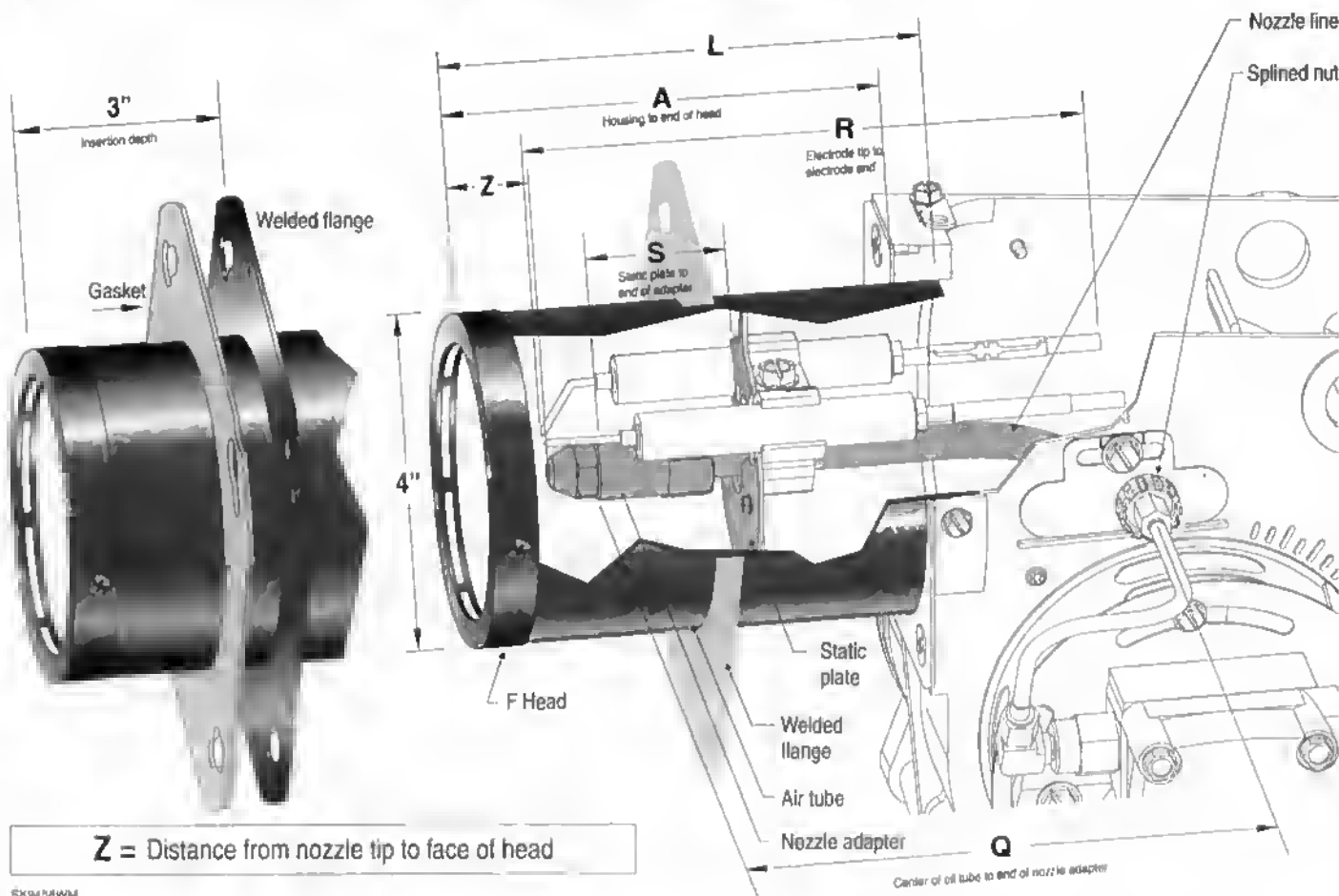


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Prepare burner & site

Check/adjust "Z" dimension - "F" head

Figure 2 — "F" heads (plus burner detail for all head styles) (see Table 2 for dimensions)



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- See Figure 2 above. The important "Z" dimension is the distance from the face of the nozzle to the flat face of the head. This distance for **F** heads is 1 1/8". The "Z" dimension is factory set for burners shipped with the air tube installed. Even if factory set, verify that the "Z" dimension has not been changed.
- Use the following procedure to adjust the "Z" dimension, if it is not correct:
 - Turn off power to the burner.
 - Disconnect the oil connector tube from the nozzle line.
 - See Figure 2. Loosen the splined nut from the nozzle line. Loosen the hex head screw securing the escutcheon plate to the burner housing.
 - Place the end of a ruler at the face of the nozzle and, using a straight edge across the head, measure the distance to the face of the head. (A Beckett T500 gauge may also be used.)
 - Slide the nozzle line forward or back until this dimension for **F** heads is 1 1/8".
 - Tighten the hex head screw to secure the escutcheon plate to the burner chassis. Then tighten the splined nut and attach the oil connector tube.
- Recheck the "Z" dimension periodically when servicing to ensure the escutcheon plate has not been moved. You will need to reset the "Z" dimension if you replace the air tube or nozzle line assembly.

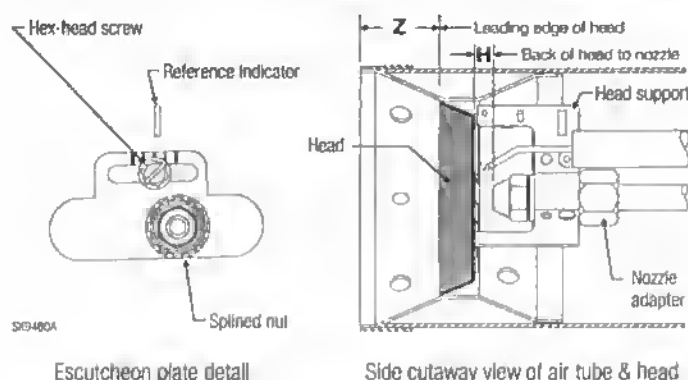
NOTICE The Beckett **Z** gauge (part number Z-2000) is available to permit checking the **F** head "Z" dimension without removing the burner from the appliance.

Table 2 — Dimensions (in inches) for Figures 2, 3 and 4

Dimension (inches)	Burners for boiler model numbers:		
	GO-2 GO-3	GO-4 GO-5 GO-6	GO-7 GO-8 GO-9
Head type	L1	F	V1
See figure numbers:	3 & 2	2	4 & 2
A (usable tube length)	5	4 1/2	5
H (nozzle to head), ± 1/32	1/4	N/A	1/4
L (total tube length)	5 1/2	5	5 1/2
R (electrode length), ± 1/4	6 1/8	6 3/4	6 1/8
S (adapter to static plate), ± 1/16	1 3/8	1 3/8	1 3/8
Q (nozzle line length)	5 3/16	5 7/16	5 3/16
Z	1 3/8	1 3/8	1 3/8

Check/adjust "Z" dimension - "L1" head

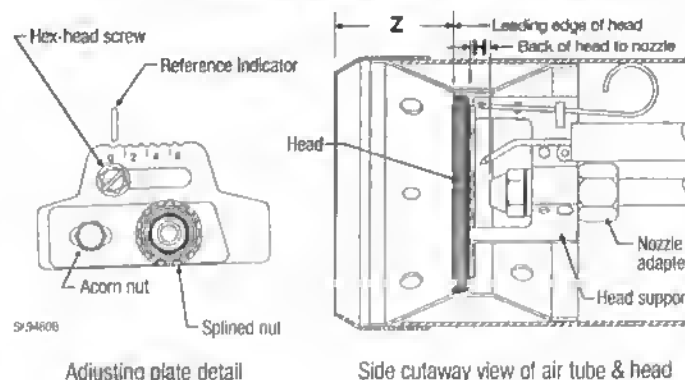
Figure 3 — "L1" heads (see Table 2 and Figure 2 for dimensions)



1. See Figure 3. The important "Z" dimension is the distance from the leading edge of the head to the end of the air tube. This distance for **L1 heads** is 1 3/4". The "Z" dimension is factory set for burners shipped with the air tube installed. Even if factory set, verify that the "Z" dimension has not been changed.
2. Use the following procedure to adjust the "Z" dimension, if it is not correct:
 - Turn off power to the burner.
 - Disconnect the oil connector tube from the nozzle line.
 - See Figure 3. Loosen the splined nut from the nozzle line. Loosen the hex head screw securing the escutcheon plate to the burner housing.
 - Place the end of a ruler at the leading edge of the head and, using a straight edge across the end of the tube, measure the distance to the end of the air tube. (A Beckett T500 gauge may also be used.)
 - Slide the nozzle line forward or back until this dimension is 1 3/4" for **L1 heads**.
 - Tighten the hex head screw to secure the escutcheon plate to the burner chassis. Then tighten the splined nut and attach the oil connector tube.
3. Recheck the "Z" dimension periodically when servicing to ensure the escutcheon plate has not been moved. You will need to reset the "Z" dimension if you replace the air tube or nozzle line assembly.

Check/adjust "Z" dimension - "V1" head

Figure 4 — "V1" heads (see Table 2 and Figure 2 for dimensions)



1. See Figure 4. The important "Z" dimension is the distance from the leading edge of the head to the end of the air tube. This distance for **V1 heads** is 1 3/4". The "Z" dimension is factory set for burners shipped with the air tube installed. Even if factory set, verify that the "Z" dimension has not been changed.
2. Use the following procedure to adjust the "Z" dimension, if it is not correct:
 - Turn off power to the burner.
 - Disconnect the oil connector tube from the nozzle line.
 - See Figure 4. Loosen the splined nut from the nozzle line. Loosen the hex head screw securing the escutcheon plate to the burner housing.
 - Loosen the acorn nut. Move the head adjusting plate until the "0" lines up with the reference indicator on the housing, and retighten the hex head screw. Place the end of a ruler at the leading edge of the head and, using a straight edge across the end of the tube, measure the distance to the end of the air tube. Or use a Beckett T500 gauge. Slide the nozzle line forward or back until this dimension is 1 3/4" for **V1 heads**. Tighten the acorn nut.
 - Tighten the hex head screw to secure the escutcheon plate to the burner chassis. Then tighten the splined nut and attach the oil connector tube.
3. Recheck the "Z" dimension periodically when servicing to ensure the escutcheon plate has not been moved. You will need to reset the "Z" dimension if you replace the air tube or nozzle line assembly.

Set head position adjusting plate ("V1" head only)

1. After setting "Z" dimension, loosen head adjusting plate hex head screw and nozzle line splined nut. Move the nozzle line assembly until the burner reference indicator lines up with the head adjusting plate setting number given in Table 3.
2. Tighten the hex head screw and splined nut. (DO NOT loosen the acorn nut when setting head position.)
3. The position of the head affects air flow volume and pattern. For most applications, the burner will perform satisfactorily with the air adjustment plate setting of Table 3.
4. If combustion results indicate the need for change, adjust the head position adjusting plate forward or back one position at a time to optimize combustion.

Table 3 — Adjusting plate settings with "V1" head

Bolter model	Adjusting plate setting
GO-7	4
GO-8	5
GO-9	5

Adjust, pipe & wire burner**Startup & adjust burner****Mount burner on appliance****Mounting**

- Bolt the burner to the boiler using the factory-mounted flange and gasket supplied.

Mounting dimensions

- Verify that the air tube and welded flange installed on the burner provide the correct insertion depth. See Figure 2, page 6.
- The end of the air tube should normally be ¼" back from the inside wall of the combustion chamber. Never allow the leading edge of the head assembly to extend into the chamber.

Connect fuel lines

Carefully follow the **fuel unit manufacturer's literature** and the latest edition of NFPA 31 for oil supply system specifications. If this information is unavailable, use the following basic guidelines.

NOTICE Fuel units with automatic bypass do not require a bypass plug.

WARNING The burner fuel unit is shipped without the bypass plug installed. You must install this plug on two-pipe oil systems. **DO NOT** install the plug in the fuel unit if connected to a one-pipe oil system. Failure to comply could cause fuel unit seal failure, oil leakage and potential fire and injury hazard.

Fuel supply level with or above burner —

The burner may be equipped with a single-stage fuel unit for these installations. Connect the fuel supply to the burner with a single supply line. If you want a one-pipe system (making sure the bypass plug is NOT installed in the fuel unit.) Manual venting of the fuel unit is required on initial start-up. If connecting a two-pipe fuel supply, install the fuel unit bypass plug.

WARNING The oil supply inlet pressure to the fuel unit cannot exceed 3 psi. Install a pressure-limiting device in accordance with NFPA 31.

Fuel supply below the level of the burner —

When the fuel supply is below the level of the burner, a two-pipe fuel supply system is required. Depending on the fuel line diameter and horizontal and vertical length, the installation may also require a two-stage pump. Consult the fuel unit manufacturer's literature for lift and vacuum capability.

Fuel line installation —

- Continuous lengths of heavy wall copper tubing are recommended. **Always use flare fittings. Never use compression fittings.**
- Always install fittings in accessible locations. Fuel lines should not run against the appliance or the ceiling joists (to avoid vibration noise).

WARNING Never use Teflon tape on any fuel fitting. Tape fragments can lodge in fuel line components and fuel unit, damaging the equipment and preventing proper operation.

Fuel line valve and filter —

- Install two high quality **shutoff valves** in accessible locations on the oil supply line. Locate one close to the tank and the other close to the burner, upstream of the filter.

NOTICE Some states require these valves to be fusible-handle design for protection in the event of fire. We recommend this as good industry practice for all installations.

- Install a generous capacity **filter** inside the building between the fuel tank shutoff valve and the burner, locating both the filter and the valve close to the burner for ease of servicing. Filter should be rated for 50 microns or less.

Wire burner**Wiring diagram**

- Refer to wiring diagram in boiler manual for electrical connections.

NOTICE All wiring must be in accordance with the latest revision of National Electric Code NFPA 70 and local codes and regulations.

Startup burner/set combustion

WARNING Do not attempt to start the burner when excess fuel or vapor has accumulated in the appliance. Starting the burner under these conditions could result in a puffback of hot combustion gases, high smoke levels, or otherwise hazardous operation.

1. Open the shutoff valves in the oil supply line to the burner.
2. Set air band and air shutter to the settings listed in Table 1, page 4. This is an initial setting only. Additional adjustments must be made with instruments.
3. Set the thermostat substantially above room temperature.
4. Close the line voltage switch to start the burner. If the burner does not start within a few seconds you may have to reset the safety switch of the burner primary control.
5. **Bleed air from fuel unit** as soon as burner motor starts rotating.
To bleed the fuel unit, attach a clear plastic hose over the vent plug. Loosen the plug and catch the oil in an empty container. Tighten the plug when all air has been purged from the oil supply system.
 - If the burner locks out on safety during bleed, reset the safety switch and complete the venting procedure. Note — Electronic safety switches can be reset immediately; others may require a three- to five-minute wait.
 - If burner stops after flame is established, additional venting is probably required. Repeat the venting procedure until the pump is primed and a flame is established when the vent plug is closed.
 - For R7184 primary controls, see *Technician's Quick Reference Guide*, Beckett part number 61351, for special pump priming sequence.
 - Prepare for combustion tests by drilling a ¼" sampling hole in the flue pipe between the appliance and the barometric draft regulator.
6. **Initial air adjustment** — Using a smoke tester, adjust the air shutter (and air band, if necessary) to obtain a clean flame. Now the additional combustion tests with instruments can be made.

Startup & adjust burner

Set combustion with instruments

WARNING The combustion must be adjusted using test instruments. Failure to do so could result in burner or boiler failure, causing potential severe personal injury, death or substantial property damage.

1. Let burner run for approximately 5 to 10 minutes.
2. Set the barometric damper to result in an over-fire draft between -0.01 and -0.02 inches w.c. over fire.
3. Check oil pump pressure. It must be as listed in Table 1, page 4.
4. Follow these four steps to properly adjust the burner:

Step 1: Adjust air until a trace smoke level is achieved.

Step 2: At the trace of smoke level, measure the CO_2 (or D_2). This is the vital reference point for further adjustments.

- Example: 13.5% CO_2 (2.6% D_2).

Step 3: Increase the air to reduce CO_2 by 1 to 2 percentage points. (O_2 will be increased by approximately 1.4 to 2.7 percentage points.)

- Example: Reduce CO_2 from 13.5% to 11.5%. (D_2 from 2.6% to 5.3%.)

Step 4: Recheck smoke level. It should be zero.

- This procedure will result in a CO_2 reading between 11% and 12%, providing a margin of reserve air to accommodate variable conditions.
 - If the draft level has to be changed, recheck the smoke and CO_2 levels. Adjust the burner air if necessary.
5. Once combustion is set, tighten all fasteners on air band, air shutter and head adjusting plate or escutcheon plate.
 6. Start and stop the burner several times to ensure satisfactory operation. Test the primary control and all other appliance safety controls to verify that they function according to the manufacturer's specifications.

Troubleshooting

Burner does not start

The primary control may not be pulling in — Check for:

- Broken wires
- Dirty thermostat contacts
- Defective thermostat
- Defective primary control

The motor is out on thermal overload — Check for:

- Seized motor bearing
- Fan locked against housing
- Seized fuel pump
- Defective wiring

Burner starts, but there is no flame after valve-on delay

There may be insufficient oil flow — Check for:

- Defective fuel pump
- Pump strainer clogged
- Defective solenoid valve
- Loose coupling
- Air leaks in suction line
- Clogged or dirty nozzle
- Clogged fuel filter

Troubleshooting (continued)

There is no ignition spark — Check for:

- Defective/loose wiring connections at primary control
- Ignitor springs not touching electrodes
- Incorrect electrode settings
- Defective porcelain insulator on electrode assembly
- Defective igniter

There is oil and spark, but no flame — Check for:

- Loose, dirty or defective nozzle
- Low pump pressure
- Excess air/high draft
- Incorrect electrode settings
- Improper oil conditions
- Improper nozzle position. To verify position, see pages 6 and 7.

Burner starts and has flame, but flame goes out

Primary control will shut off flame — Check for:

- Dirty cad cell
- View of fire obstructed, so that cad cell cannot see flame
- Defective cad cell
- Defective primary control
- Loss of oil prime

Burner starts and has a smoky flame — Check for:

- Insufficient combustion air
- Improper mixing of oil and air
- Insufficient draft
- Flame impingement on target wall or crown sheet of boiler
- Nozzle tip damaged, scratched or has deposits around opening
- Nozzle afterdrip due to faulty solenoid or cutoff valve

You hear mechanical noise from the burner — Check for:

- Loose fan
- Air in oil line
- Defective pump gears
- Obstructed suction line
- Defective motor bearings
- Pump and motor shaft misaligned
- Defective igniter
- Defective primary control

You hear combustion noise — Check for:

- Insufficient draft in breeching or overfire
- Improper mixing of oil and air
- Incorrect air band or air shutter setting
- Loose or dirty fan

There is puffback from burner — Check for:

- Delayed ignition
- Nozzle afterdrip due to poor cutoff
- Excessive draft
- Incorrect air band or air shutter setting

There is nozzle drip — Check for:

- Air in supply line from oil tank to fuel pump
- High vacuum
- Hot nozzle or oil line assembly due to improper draft, misadjusted burner or blocked flueways in boiler

Service & maintain burner

Perform annual maintenance

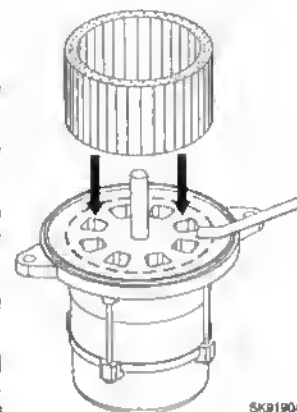
WARNING This equipment must be serviced only by a qualified service agency. The appropriate test instruments must be used. Failure to do so could result in burner or appliance failure, causing potential severe personal injury, death or substantial property damage.

- ❑ Replace the oil supply line filter. The line filter cartridge must be replaced to avoid contamination of the fuel unit and nozzle.
- ❑ Inspect the oil supply system. All fittings should be leak-tight. The supply lines should be free of water, sludge and other restrictions.
- ❑ Remove and clean the pump strainer if applicable.
- ❑ Replace the nozzle with an equivalent nozzle.
- ❑ Clean and inspect the electrodes for damage, replacing any that are cracked or chipped.
- ❑ Check electrode tip settings. Replace electrodes if tips are rounded.
- ❑ Inspect the igniter spring contacts.
- ❑ Clean the cad cell grid surface, if necessary.
- ❑ Inspect all gaskets. Replace any that are damaged or would fail to seal adequately.
- ❑ Clean the blower wheel, air inlet, air guide, retention head and static plate of any lint or foreign material.
- ❑ If motor is not permanently lubricated, oil motor with a few drops of SAE 20 nondetergent oil at each oil hole. DO NOT over oil motor. Excessive oiling can cause motor failure.
- ❑ Check motor current. The Amp draw should not exceed the nameplate rating by more than 10%.
- ❑ Check all wiring for secure connections or insulation breaks.
- ❑ Check the pump pressure and cutoff function.
- ❑ Check primary control safety lockout timing.
- ❑ Check ignition system for proper operation.
- ❑ Inspect the vent system and chimney for soot accumulation or other restriction.
- ❑ Clean the appliance thoroughly according to the manufacturer's recommendations.
- ❑ Check the burner performance. Refer to the section "Set combustion with instruments."

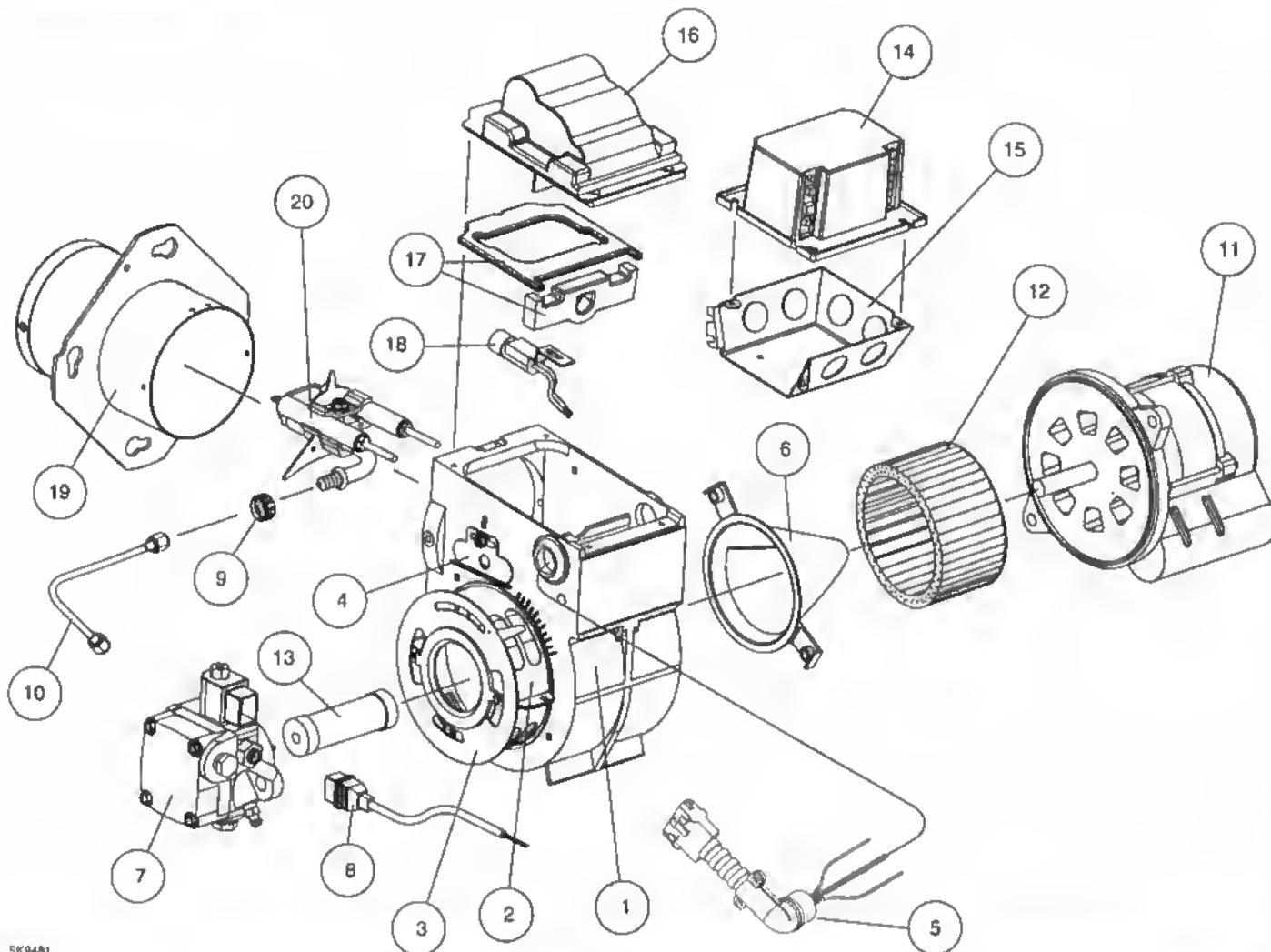
It is good practice to make a record of the service performed and the combustion test results.

To replace blower wheel:

1. Turn off all power to the burner before servicing.
2. Disconnect the wires to the burner motor.
3. Remove the bolts securing the blower motor to the housing.
4. Remove the blower motor and wheel.
5. Remove the existing wheel.
6. As shown at right, slide the new blower wheel onto the shaft.
 - Place a .030" ($1/32" \pm 1/64"$) feeler gauge on the motor as shown.
 - Slide blower wheel toward motor until it contacts feeler gauge.
 - Rotate the wheel until the set screw is centered on the flat of the motor shaft.
 - Tighten the set screw to secure the wheel.
7. DO NOT use a motor that has endshield openings outside the blower wheel circumference represented by the dashed line.
8. Install the motor on the burner housing. Tighten screws. Reconnect motor wires.
9. Restore power, start the burner and perform combustion tests. Refer to "Set combustion with instruments."



Replacement parts



SK9481

Item	Description	Part Number
1	Burner housing assembly	5877
2	Air band assembly — 8 slot	6151501
(note 1)	Screw 10-24 x 1/2"	4198
	Nut 10-24 square	4150
3	Air shutter — 4 slot	3709
(note 1)	Screws 10-24 x 5/16"	4292
4	Escutcheon plate (F & L1 heads)	3493
(note 1)	Head adjusting plate assembly (V1 head)	5941
	Screw 10-32 x 5/16"	4292
5	Wire harness with molex	31907
6	Air guide (note 2)	31231U
(note 1)		
7	Pump A2EA6520N621L (CleanCut)	21844U
	Mounting screws 1/4-20 x 7/8"	4189
8	Valve cordset (for 21844 pump)	21807
9	Splined nut	3666
10	Connector tube assembly, 8"	5394
11	Motor PSC	21805U
	Mounting screws 1/4-20 x 7/8"	4189

Item	Description	Part Number
12	Blower wheel (use only RWB replacement)	2999U
13	Coupling	2454
14	Primary control R7184P-1080 (valve-on & motor-off delay)	7488U
15	Electrical box	5770
16	Igniter, including gasket kit	51771U
17	Igniter gasket kit	51304
18	Cad cell detector	7006U
19	Air tube combination — see Table 1, page 4	Specify
20	Electrode kit F head air tubes	5780
	M head air tubes	5940

Note 1 These items are included in the 5877 burner housing assembly.

Note 2 Factory installed. Please do not remove from burner!

Service & maintain burner

Owner's information

WARNING This burner must be installed, adjusted and started only by a **qualified service agency** — an individual or agency, licensed and experienced with all codes and ordinances, who is responsible for the installation and adjustment of the equipment.

- Have your equipment **inspected and adjusted at least annually** by your **qualified service agency** to assure continued proper operation.
- Installation and adjustment of the burner requires technical knowledge and the use of combustion test instruments. **Do not tamper** with the unit or controls. Call your **qualified service agency**.
- **Incorrect operation of the burner could result in severe personal injury, death or substantial property damage.**

The following could result in fire hazard, severe personal injury, death or substantial property damage. Read carefully.

- **Never attempt to use gasoline** in your heating appliance.
- **Never store gasoline or combustible materials** near the burner or appliance.
- **Never attempt to burn garbage or refuse** in your appliance.
- **Never attempt to light the burner/appliance** by throwing burning material into the appliance.
- **Never attempt to use crankcase or waste oil** or material other than the approved fuel oils in this burner.
- **Never restrict the air inlet openings** to the burner or the combustion air ventilation openings in the room.

Owner service and maintenance

Properly installed and maintained, your **AFG** burner will provide years of efficient, trouble-free operation. Please take care of your equipment by following the warnings provided and by doing the following (notify your qualified service agency if you find anything wrong):

Annually (minimum)

- Have your burner/heating appliance serviced at least annually by your qualified service agency as noted above.

Daily

- Check the room in which your burner/appliance is installed. Make sure:
 - air ventilation openings are clean and unobstructed
 - nothing is blocking the burner inlet air openings
 - no combustible materials are stored near the heating appliance
 - there are no signs of oil or water leakage around the burner or appliance.

Weekly

- Check your oil tank level. Always keep your oil tank full, especially during the summer, in order to prevent condensation of moisture on the inside surface of the tank.

Warranty

Beckett warrants its equipment specifically to those who have purchased it for resale, including your qualified service agency (dealer). In the event of any problems with your equipment or its installation, you should contact your dealer for assistance.

The Oil-Heat Manufacturers' Association supports the use of low sulfur fuels as defined by ASTM D396, Grades Number 1 Low Sulfur and Number 2 Low Sulfur, as the preferred heating fuel for the following reasons:

- Low sulfur fuels reduce deposits on heat exchanger surfaces, extending the service interval between cleanings.
- The reduced deposits increase the efficiency of the appliance.
- Low sulfur fuels reduce particulate emissions.
- Low sulfur fuels reduce oxides of nitrogen emissions.



WEIL-McLAIN

